

**LEC. 16 JACK - SOIL, CLIMATE, PLANTING, HIGH DENSITY
PLANTING, NUTRIENT AND WATER MANAGEMENT,
SPECIAL CULTURAL OPERATIONS, PESTS AND DISEASES,
MANAGEMENT PRACTICES**

India is considered to be the native home of jack. In the tamil literature, jack has been given the important second position of significant 'three fruits' viz., 'Mukkani'. It is mainly distributed in the tropical humid belt. In India, Assam, Bihar, Kerala and Tamil Nadu are the main jack growing states. In Tamil Nadu lower Palani hills of Dindigul Anna District and Panruti of South Arcot Vallalar District are known for the best quality jack fruits. The fleshy carpel (which is botanically the perianth) is the edible portion. Hundred gram edible portion contains 19.8g carbohydrate mainly as sugars, 1.9f protein, 0.1f fat, 1.1 g fibre, 20 mg calium, 41 mg phosphorus 0.56 mg iron, 175 mg carotene (Vit. A), 0.03 mg thiamine, 0.13 mg riboflavin, 0.4 mg niacin and 7 mg citamin C. one hundred grams of jack carpels supply 88 Kcal of energy.

Recently it has been reported that jack fruit could be very useful in the treatment of the dreaded disease of human being AIDS. An extract of jack fruit was seen to have inhibited the growth of HIV infection *in vitro*. The power of this substance called jacaline was discovered by Jean Favero, Department of Microbiology and Antibacterial limmunology, Montpellier University, France. 'Jacaline' is inactive on lymphocytes which hare already infected but has proved its might by protecting the healthy ones. After modifying this molecule to make it less toxic, scientists are planning to use in vivo (technical News from France, Centre for Documentation on Universities Science and Technology, Office of the Counsellor for Cultural, Scientific and Technical Co- operation. Embassy of France, 2, Aurangazed Road, New Delhi, (India).

Apart from its use as a table fruit, jack is popular fruit with the housewife for making pickles, for dehydration into jack leather or thin round papad. Canned jack fruit, syrup, jam, jelly and candy have also been attempted. Preservation of ripe flackes in bottles after mixing with sugar and honey is very common in west coast. The dehydration of salted flakes for use as substitute for potato chips after frying in oil or ghee is another practice there.

The outer pericarp of the fruit and sterile flowers (present in between the fleshy fertile flackes) is praised as cattle feed relished by the cattle as such or after mixing with rice gruel.

From seeds, a starchy flour is made. The seeds are also relished when boiled or roasted and eaten out of hand or after soaking in syrup for some time. The seeds are also popular ingredients in many culinary preparations. The latex from bark contains a large amount of resins and is often used to plug holes in earthen containers. The timber is valuable in construction and furnishing. The leaves are used as fodder and particularly relished by goats.

Climatic and soil requirements :

Jack grows well and gives good yield in warm humid climate of hill slopes and hot humid climate of plains. From sea level up to an elevation of 1200 M jack can be grown successfully. A temperature range of 22-35⁰ C will be ideal. It can not tolerate frost as well as drought. Under low humidity the bearing is poor and the fruits also do not develop and taste. The West coast plains with high humidity are found to be very well suited. Though it tolerates a variety of soils, a deep rich alluvial or open textured loamy soil with slightly acidic condition (pH 6.0 – 6.5) and perfect drainage is ideal.

VARITIES

Cultivated jack types are classified into two groups (1) firm flesh (2) soft flesh.

Singapore (or) Ceylon jack

It was introduced in Tamil Nadu from Sri Lanka. Fruits are medium in size each weighing 7-10 kg. The carpels are crisp, sweet, yellow with strong pleasant aroma. It is a precocious bearer viz., even seedling progenies will start bearing from 3 years after planting (normally in other types the seedlings progenies will start bearing only from 7-8 years after planting). Fruits will be available from March – June and again from September to December.

Hybrid jack :

It is a cross between Singapore jack x Veliappala developed at Fruit Research Station, Kallar. Trees are precocious in bearing; carpels are bigger in size sweeter than the parents.

Burliar – 1 : (T Nagar selection)

It was developed at Fruit Research Station, Burliar. The trees are medium in height and prolific in bearing.

PLR – 1 : (Palur-1)

It is a high yielding variety developed at Vegetable Research Station, Palur of Tamil Nadu Agricultural University. A single plant section isolated in Panikkankuppam village near Panruti of South Arcot Vallalar District of Tamil Nadu. The fully ripe fruits have flat stigmatic surface instead of a spiny surface. The special feature of this genotypes is that the trees bear fruits twice in a year viz., fruits will be available in the regular jack season March to June and an off season crop during October to December is also available. Each tree bears about 60-80 fruits. The average fruit weight is 12 kg containing 115-120 flakes. The total flake weight per fruit is 2.36 kg which accounts for 19.68 % of the totalfruit weight. Flakes pale yellow in colour, crisp and sweet; TSS is 19⁰brix.

PPI – 1 : (Pechiparai – 1)

It was developed at Horticultural Research Station, Pechiparai of Tamil Nadu Agricultural University by clonal selection from Mulagummoodu local. Trees are medium tall maximum bearing in tree truck. On average each tree bears 107 fruits weighing 1818 kg per year in two seasons, viz., April – June and November – December. Carpels are sweet, crisp, tasty with pleasant aroma. Suitable for commercial planting as well as for planting in home garden.

Propagation and planting :

When propagated through seeds, jack exhibits as wide variation among its progenies. Hence vegetative propagation is recommended. Commercially inarching on 10 months old jack seedlings is done to produce vegetative progenies. The grafts come to bearing within 4 ½ -5 years when compared seedlings which take 7-8 years normally.

Soft wood grafting (cleft method) on 1 ½ months old seedlings with scion of 3-4 months old also was found to be successful. Since the viability of seeds is very low, seeds have to be sown immediately after extraction to raise rootstocks. Rudrakshi and A. hirsute are also used as rootstocks. In jack modified forkhert method of budding is also done. In Malaya air layering after etiolation is reported to be successful. At Pechiparai (tamil Nadu), patch budding on 3-5 months old rootstock seedlings done during January – February and October-November was found to be very successful. In this method the budded plants are ready for planting in 8 months.

Pits of size 1 metre cube are dug at a spacing of 9-12 M pits they filled with top soil and 10 kg FYM and the grafts are planted in the centre of the pits during June – September.

Training and manuring :

Jacks are trained to single stem, early side branches should be removed then and there so that a uniform smooth trunk develops for a height of 1.5 – 2 M and then scaffold branches should be permitted to arise. This trunk is going to develop fruit buds and hence should be kept free of growths. The nutrients should be applied as detailed below :

Quantity (Kg / plant)

Manure / Nutrients	1 year after planting	Annual increase	5th year
FYM	10 kg	10 kg	50 kg
N	0.150	0.150	0.750
P	0.080	0.080	0.400
K	0.100	0.100	0.500

The fertilizers are applied during rainy season. If irrigation is available they can be split into two and applied twice in a year June – July and September – October. The manures and fertilizers can be applied in a circular trench taken 50 -06 cm away from the trunk.

Irrigation :

Though jack is cultivated under rainfed conditions, it is very sensitive to drought. Hence irrigation should be done depending on the type of soil, season etc. so that, there should not be any moisture stress especially during flowering and fruitset. Similarly too much of soil moisture will affect the quality of fruits. The flakes will develop an insipid taste when there is excess soil moisture.

Intercultivation :

During the prebearing age pulses can be raised as intercrop and dried leaves can be spread below the trees to serve as a mulch for moisture conservation. As the trunk increase in size, the active buds of female inflorescence develop from the trunk as well as from main scaffold branches. This type of bearing habit is called 'cauliflorus'. These fruit buds should be protected from any possible damage by rubbing body of the stray cattle such as buffaloes through spreading dried thorny bushes. This is very essential especially when there is no proper fence in the fields.

The male inflorescence (catkins) are seen in the current season growth while female catkins are produced as cauliflorus (on trunk and main scaffold). Some times there will be more production of female flowers as well as male flowers but there will be no fruitset. This is mainly due to lack of proper pollination. The male catkins show protrusion of anthers on their surface of the spikes. The stigma becomes visible by 8 AM from 4th day after it comes from the sheath. Every day between 8.30 AM and 9.30 AM, the male catkins showing the pollen have to be collected and rubbed on the sticky surface of female of female spikes. This can be done for 10-15 days, for each spike. Such hand pollination will help in proper fruitset and yield.

Plant protection :**Pests :**

Bud weevil L (*Ochyromera artocarpi*)

It bores into the tender buds, shoots and fruits.

Management :

Destroy fallen fruits and buds, collect and kill grubs, adults and then spray endosulfan (0.035%).

DISEASES :**Fruit rot : (*Rhizopus artocarpi*)**

It causes premature fall of young fruits due to rotting and may result in heavy loss in yield under very humid conditions.

Management

Spraying Disthane M. 45 (0.2%) or Bavistin (0.05%) or Fytolan (0.2%) at 15 days interval during fruit growth.

Harvest and yield :

Normally jack starts producing fruits from 7th – 8th year onwards. Grafted plants can start yield from 4th to 5th year itself. In Singapore jack even seedlings start bearing from 3rd year. Normally the fruits will be available from March to June. In higher elevation harvest extends upto September. Even in plains certain genotypes bear an off season crop during October – December. The yield ranges from 20 to 100 fruits/tree. The fruit weight varies from 10 to 30 kg.